

excellent emulsifying or solvent power for cyclosporin A, and at the same time inhibit the synthesis of prostanoids such as prostaglandins and thromboxanes, which can be utilized to reduce nephrotoxicity and to cause inflammatory reactions in the skin to die down and at the same time promotes the absorption of cyclosporin A through the intact skin. The particular advantage of the solutions according to the invention consists, in addition to the achievement of high concentrations of dissolved cyclosporin A of at least 10%, in that the D- α -tocopherol derivatives, as derivative of natural vitamin E, have intrinsic effects which on the one hand counteract toxic effects of cyclosporin A at the customary high doses on oral administration and on the other hand by means of the absorption-promoting action increase the intended immunosuppressive effect in the topical treatment of psoriasis.

[0024] Thus vitamin E and its derivatives affect arachidonic acid metabolism in the sense of an inhibition of prostaglandin, thromboxane and leucotriene biosynthesis and an increase in prostacyclin formation. These properties are connected with a biological inhibition of inflammation and with thrombotic disorders (Machlin, Vitamin E.; in: Machlin, Handbook of Vitamins: Nutritional [sic], Biochemical and Clinical Aspects, pages 99-145, Marcel Dekker, New York, 1984). After oral administration, vitamin E can also promote the activity of non-steroidal anti-inflammatory drugs (Bertolini et al., Rivista di Farmakologia et Therapia 8, pages 27-34 (1982); Klein & Blankenhorn, Vergleich der klinischen Wirksamkeit von Vitamin E und Diclofenac Natrium bei Spondylitis Ancylosans (Morbus Bechterew) [Comparison of the Clinical Activity of Vitamin E and Diclofenac Sodium in Ankylosing Spondylitis (Bechterew's disease)], Vitaminspur 2, pages 137-142 (1987)). After topical administration, vitamin E permeates the stratum corneum very well. Quantitative absorption studies were carried out on the skin of experimental animals. In this way, 16 hours after application of 300 μ g of a 5 percent vitamin E solution in ethanol per cm^2 , 10.7% of vitamin E was found in the horny layer and about 40.9% in underlying skin layers (Djerassi et al., Vitamin E: Biochemical function and its role in cosmetics, Drug & Cosmetic Industry 13, No. 1, pages 29-31, 34, 78 (1986)). Applied locally, vitamin E acts as a membrane-stabilizing antioxidant and inhibits the release of histamine and hydrolytic enzymes, for example from the mast cells and the lysosomes, by stabilization of their membranes. It also inhibits the synthesis of certain prostaglandins, deactivates oxygen radicals and detoxifies corresponding secondary products (Sies, Bildung von Superoxidradikalen und Peroxiden [Formation of Superoxide Radicals and Peroxides]; in: Superoxiddismutase—Biochemie und therapeutischer Einsatz [Superoxide Dismutase—Biochemistry and Therapeutic Use]; editors Puhl & Ries, Perimed Verlag, Erlangen, 1982). Vitamin E moreover increases the moistness of the skin and acts virtually as an occluding agent. All these described properties are advantageous in the treatment of psoriasis.

[0025] Cyclosporin A now dissolves completely unexpectedly in such a high concentration of a 10% in preparations according to the invention that the combination can be

therapeutically usefully employed as a solution both in soft gelatin capsules and in topical formulations.

[0026] In addition, the formulations can contain thickeners, such as colloidal silicic acid or polyacrylic acid or polyacrylic acid derivatives or cellulose derivatives, as well as antioxidants and flavourings.

5. EXAMPLES

Example 1

(Soft Gelatin Capsule)

[0027] The composition of the formulation was as follows:

Cyclosporin A	100 mg	
Ethyl alcohol 96%	200 mg	
Vitamin E-TPGS	300 mg	
Polyethoxylated castor oil	200 mg	as ethoxylation product of a fat
Polyethylene glycol 400	200 mg	

[0028] The mixture was filled into hard gelatin capsules [sic] and tested in a cross-over experiment in dogs in comparison with a commercially available product (Sandimmun Optival[®]). The blood level analysis was carried out by means of fluorescence immuno-assay [sic].

[0029] It can be seen clearly from FIG. 1 that the capsule preparation according to the invention is equivalent to the commercially available product with respect to blood levels.

1. Pharmaceutical preparation, consisting of or containing cyclosporin A, an emulsifying α -tocopherol derivative, an ethoxylation product of vegetable oils, fatty acids or fats as a further emulsifier and a pharmaceutically customary alcohol.

2. Pharmaceutical preparation according to claim 1, characterized by D- α -tocopherol polyethylene glycol 1000 succinate as α -tocopherol derivative.

3. Pharmaceutical preparation according to one of the preceding claims, characterized in that it contains up to a 9-fold amount of an α -tocopherol derivative on the basis of cyclosporin A.

4. Pharmaceutical preparation according to one of the preceding claims, characterized in that it contains a 10% of cyclosporin A on the basis of the composition.

5. Pharmaceutical preparation according to one of the preceding claims, characterized in that it contains ethanol or isopropanol as pharmaceutically customary alcohol, in particular in amounts of up to 30% on the basis of the composition.

6. Pharmaceutical preparation according to one of the preceding claims, in a form characterized in that it contains an ethoxylated castor oil as a further emulsifier.

7. Pharmaceutical preparation according to claim 6, characterized in that it contains a thickener.

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